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A cholinesterase sensor based on a graphite electrode modified with 1,3-disubstituted calixarenes

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Abstract

New cholinesterase sensors based on screen-printed graphite and graphite/epoxy electrodes modified with 1,3-disubstituted calix[4]arenes were developed for the detection of compounds that form host-guest complexes (using copper(II) and oxalate ions as an example). The effect of calix[4]arenes on the biosensor signal was studied under homogeneous and heterogeneous conditions. It was found that the effect of the studied compounds was due to changes in the electrostatic interactions and mobility of enzyme effectors in the electrode layer. Procedures were developed for the determination of Cu(II) by its activating effect in the concentration range 0.05-4.0 mM and of oxalate ions by their inhibiting effect in the concentration range 0.5-20 mM.

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